

State of California
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Response

PUBLIC HEARING TO CONSIDER AMENDING THE TEST METHODS DESIGNATED FOR
DETERMINING THE BENZENE, AROMATIC HYDROCARBON, OLEFIN AND SULFUR CONTENT OF
PHASE 2 GASOLINE

Public Hearing Date: October 26, 1995
Agenda Item No.: 95-11-2

I. GENERAL

This rulemaking was initiated by issuance of a notice of public hearing and the Staff Report: Initial Statement of Reasons for Rulemaking ("staff report"), which was available for inspection and published in the California Regulatory Notice Register on September 8, 1995. The notice was also mailed to each of the individuals described in Government Code section 11346.4(a)(1) through (4), ~~title 1, California Code of Regulations (CCR)~~ on that date. The staff report, entitled "Public Hearing to Consider Amending the Test Methods Designated for Determining the Benzene, Aromatic Hydrocarbon, Olefin, and Sulfur content of Phase 2 Gasoline," is incorporated by reference herein. The staff report included the text of the proposed amendments and the rationale for the proposal. The amendments update the test methods for measuring the benzene, aromatic hydrocarbon, olefin and sulfur content of gasoline for compliance with the Phase 2 reformulated gasoline (RFG) requirements, which were adopted by the Air Resources Board (ARB or Board) in November of 1991 and take effect in March of 1996.

At the October 26, 1995 hearing the Board approved the regulations as originally proposed with modifications presented by staff. The modifications were developed in response to comments and suggestions received during the 45-day public comment period. The modified regulations were made available to the public for comment December 11, 1995, with a notice of public availability of modified text, which is incorporated herein by reference.

The regulation setting forth the test method designations incorporates by reference the following American Society of Testing and Materials (ASTM) test methods: ASTM D5580-95 (benzene and aromatic hydrocarbons), ASTM D1319-9X (olefins), and ASTM D2622-94 and ASTM D5453-93 (sulfur). These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to print them in the CCR. The documents are complicated and lengthy test methods that would add unnecessary additional volume to a complex regulation. As the audience for these documents is small -- primarily oil companies, gasoline distributors, environmental testing companies and manufacturers of fuel test instrumentation -- distribution to all recipients of the CCR is not needed. Furthermore, it is longstanding and accepted practice for the ARB to incorporate test methods by reference, and the affected public is accustomed to this format.

The ASTM test methods were made available in the context of the subject rulemaking in the manner specified in Government Code section 11346.7 and 1 CCR section 20(c)(2). The ASTM publishes an "Annual Book of ASTM Standards," which consists of a number of bound volumes containing the ASTM test methods incorporated in section 2263(b), title 13, CCR. These documents are available at public and college libraries, and can be purchased directly from ASTM. Individual test method documents can be purchased from ASTM as explained in the initial statement of reasons. ASTM test methods are widely used by industry, government agencies, scientists, engineers, and the general public.

The Board has determined that this regulatory action will not result in a mandate to any local agency or school district, the costs of which are reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code.

The Board has further determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

II. SUMMARY OF COMMENTS AND AGENCY RESPONSE

The Board received two written comments during the 45-day comment period and received oral and written testimony from one commenter at the October 26 hearing. The commenters are identified as follows:

- (1) A letter to Mr. Paul Rieger from Calvin O. Hodge of the Valero Refining and Marketing Company, Houston, Texas dated October 24, 1995.
- (2) A letter to Mr. James M. Shikiya from Dennis W. Lamb of the 76 Products Company, Los Angeles, California dated October 23, 1995.
- (3) Oral and written testimony from Donald Bea on behalf of the Western States Petroleum Association (WSPA).

A summary of each objection or recommendation made regarding the proposal, together with an explanation of how the proposed action has been changed to accommodate the objection or recommendation, or the reasons for make no change are set out below:

1. Comment: ASTM D5580 is subject to interference from C5 olefins and therefore ASTM D3606 is a more accurate method for determination of benzene. (Valero)

Agency Response: A comprehensive interlaboratory study sponsored by the American Society of Testing and Materials (ASTM) verified that there is no bias between ASTM D3606 and ASTM D5580. The same study also found that ASTM D5580 is more reproducible than ASTM D3606.

2. Comment: Why can't the industry use the EPA approved GC/MS test method instead of ASTM D5580? Adoption of the EPA approved GC/MS method for total aromatics would prevent refiners from having to install additional equipment. (Valero)

Agency Response: ASTM sponsored interlaboratory testing has shown ASTM D5580 to be more precise than the GC/MS method for the determination of aromatics. Furthermore, the GC/MS method was shown to have technical deficiencies and therefore the method is being revised and will be retested.

3. Comment: ARB should consider the need for a phase-in period when adopting new test methods that are relatively costly and require personnel retraining. A transition period of up to two years should be granted on a case-by-case basis during which both the old and new test methods are allowed for compliance determination. (76 Products, WSPA)

Agency Response: Staff agrees that a phase-in period may be needed for new test methods to be adopted in the future and that the need for and terms of such a phase-in period should be decided on a case-by-case basis. It was determined, however, that no phase-in period was warranted for any of the new test methods designated in this rulemaking.

4. Comment: "The current practice of setting a method's detection limit at the lower concentration level given in the scope of the method is inappropriate... CARB needs to adopt a formal protocol to determine detection (quantitation) limits, and conduct studies to determine these limits for the Phase 2 RFG test methods." (76 Products, WSPA)

Agency Response: In addition to changes in the designated test methods, the amendments confirm that no value may be reported below the detection limit of a method or, if a method does not have a published limit of detection, below the lower limit of applicability of the method as defined in the method's scope. It is recognized that some test methods may be reliable at levels below those defined in the method's scope but currently there is no test data available to verify the method's reliability or precision at these lower levels.

Subsequent to the board hearing staff met with the WSPA Working Group on Test Methods and agreed to participate in tests for extending the range of applicability of the fuels test methods and determining lower limits of quantitation.

5. Comment: "We are also concerned about staff's policy that requires that a test method's detection limit be used in place of a 'less than' determination to calculate offsets under the averaging compliance options of the Phase 2 RFG regulations. This policy results in an elevated parameter 'floor' that could reduce flexibility for producers using the averaging method of compliance... We recommend that, as a compromise, a value equal to one-half the detection (quantitation) limit be used in offset calculations as the concentration for batches on which 'less than' determinations are obtained." (76 Products)

Agency Response: Allowing a reporting limit that is below the limit of detection is technically unsound and arbitrary. The adopted amendments permit a very low reporting limit for olefins and sulfur. Test methods currently being evaluated by the ASTM will have even lower limits of detection.

6. Comment: "We understand that staff's most recent recommendation is to allow the use of D2622 (with a revised calibration procedure) for the determination of sulfur concentrations of 10 ppm and greater. Staff's recommendation is based on the results of a very recent WSPA round robin study that tested a new industry-developed calibration procedure for D2622 and compared D2622 with D5453 in terms of bias and precision. We support this proposal, which recognizes the significant expense we have already incurred in setting up D2622 in our laboratories. We also agree with staff's decision to adopt the precision derived from this round robin study for D2622.

We support the adoption of D5453 as an alternative method for determining sulfur...It has a lower detection limit than D2622 and affords industry the ability to get credit for fuels containing less than 10 ppm sulfur. Based on the data from the latest round robin, we agree that there is no bias between the two methods." (76 Products, WSPA)

Agency Response: Staff modified its original proposal for the measurement of sulfur based on the results of interlaboratory testing that became available after publication of the staff report. The modified proposals were presented at the hearing and were included in the 15 day change package. These changes include the following: (1) extending the reporting limit of ASTM D2622-94 to 10 ppm, (2) modifying the precision statement of ASTM D2622-94 according to the latest round robin results and (3) removing the requirement of a bias correction for those wanting to use ASTM D5453-93 as an alternate method.

7. Comment: "... we disagree with staff's decision to adopt the ASTM precision for D5453 for Phase 2 RFG. The ASTM precision was developed using a set of 11 samples, only two of which were gasolines...The data from the WSPA round robin is a much more accurate reflection of the precision we can expect from D5453 with Phase 2 reformulated gasoline, and should be adopted instead of the ASTM values." (76 Products, WSPA)

Agency Response: Staff did not recommend adoption of the WSPA reproducibilities for ASTM D5453-93 for several reasons. First, the precision of D5453 was not the focus of the WSPA/ARB round robin testing. Rather the primary purpose of this testing was to determine the reproducibility of ASTM D2622-94 with the modified calibration procedure. ASTM D5453-93 was included in the round robin testing for the purpose of determining bias between the two sulfur test methods. Second, the WSPA round robin quality control (QC) procedures were not as stringent as the ASTM round robin QC procedures for ASTM D5453 and this could have led to the loss of precision in the WSPA study. Finally, ASTM D5453-93 was adopted as an alternate method to ASTM D2622 because of its better published precision relative to other test methods. If the poorer precision of the WSPA round

robin correctly reflected the method's reproducibility, then ASTM D5453 could not be recommended as the alternate test method.

Subsequent to the board hearing staff met with the WSPA Working Group on Test Methods and a consensus was reached to accept the ASTM reproducibilities for ASTM D5453-93. A comprehensive interlaboratory study of all viable sulfur test methods will be carried out in 1996 with the cooperation of the ARB, WSPA and ASTM. If appropriate, staff will propose changes to the sulfur test method(s) at a future rulemaking.

8. Comment: WSPA supports the adoption of ASTM D5580-9x for the measurement of aromatics and benzene but would like to note that, for the determination of total aromatics, ASTM D5580-9x may have a slight interference due to paraffinic hydrocarbons with a carbon number greater than 12 and requests ARB's cooperation in resolving this issue. (WSPA)

Agency Response: It is unlikely that gasolines containing significant amounts of hydrocarbons above C12 will appear in California because of the T50 and T90 specifications which limit the high boiling fractions of gasoline. However, staff is prepared to cooperate with WSPA to resolve this problem should it arise.

9. Comment: WSPA supports the adoption of reproducibilities based on an extrapolated equation for the determination of olefins by ASTM D1319-9x as an interim measure but would like to revise these reproducibilities when interlaboratory studies are completed. (WSPA)

Agency Response: Staff will monitor the interlaboratory testing and if appropriate will propose revisions to the reproducibilities at a future rulemaking.

A letter was received from Aeron Arlin of the Western States Petroleum Association during the 15-day period provided for comment on the modifications to the original proposal. The letter, dated December 20, 1995 and addressed to the "Board Members" was basically supportive of the modifications sent out in the 15 day package and contained several comments regarding some of the issues raised in the 15 day package. These comments and the agency response are discussed in the following paragraphs.

1. Comment: WSPA has requested ASTM participation in the redetermination of the reproducibilities of the adopted test methods for sulfur and would like the ARB to update these when they become available.

Agency Response: ARB staff has already agreed to consider new ASTM precision data when they become available and, if appropriate, will recommend updating the test methods for sulfur at a future rulemaking.

2. Comment: WSPA would like continued cooperation from ARB staff in developing a limit-of-detection approach as applied to the adopted fuel test methods.

Agency Response: ARB staff is cooperating in this effort.

3. Comment: WSPA would like the ARB to develop a policy on a phase-in period for fuels test methods.

Agency Response: ARB staff has agreed to consider, on a case-by-case basis, a phase-in period for test methods that will be adopted in the future. ARB staff will continue to cooperate with the WSPA Working Group on Test Methods in resolving this issue when it arises.